

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A laser irradiation method comprising:

irradiating a subject formed over a substrate with a first pulse laser beam and a second pulse laser beam while relatively moving the subject so that areas which are irradiated with the first pulse laser beam and with the second pulse laser beam are overlapped with each other,

wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized, [[and]]

wherein a wavelength of the first pulse laser beam is equal to or shorter than that of visible light, and a wavelength of the second pulse laser beam is longer than that of the first pulse laser beam,

wherein a pulse width of the first pulse laser beam and a pulse width of the second pulse laser beam are different from each other, and

wherein the second pulse laser beam is a fundamental wave.

2. (Original) A laser irradiation method according to claim 1, wherein the first pulse laser beam is one selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO₂ laser, a YAG laser, a Y₂O₃ laser, a YVO₄ laser, a GdVO₄ laser, a YLF laser, a YAlO₃ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

3. (Original) A laser irradiation method according to claim 1, wherein the second pulse laser beam is one selected from the group consisting of a CO₂ laser, a YAG laser,

a Y_2O_3 laser, a YVO_4 laser, a GdVO_4 laser, a YLF laser, a YAlO_3 laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

4. (Previously Presented) A laser irradiation method according to claim 1, wherein each of the first pulse laser beam and the second pulse laser beam is shaped into a linear beam.

5. (Original) A laser irradiation method according to claim 1, wherein the first pulse laser beam satisfies an inequality of $\phi_1 \geq \arctan (W_1/2d)$, where ϕ_1 is an incident angle of the first pulse laser beam, W_1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

6. (Original) A laser irradiation method according to claim 1, wherein the second pulse laser beam satisfies an inequality of $\phi_2 \geq \arctan (W_2/2d)$, where ϕ_2 is an incident angle of the second pulse laser beam, W_2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

7. (Original) A laser irradiation method comprising:

irradiating a semiconductor film formed over a substrate with a first pulse laser beam and a second pulse laser beam while relatively moving the semiconductor film so that areas which are irradiated with the first pulse laser beam and with the second pulse laser beam are overlapped with each other,

wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized, and

wherein the first pulse laser beam melts the semiconductor film, and the second pulse laser beam satisfies $\alpha \geq 10\beta$, where α denotes an absorption coefficient with respect to a molten state of the semiconductor film, and β denotes an absorption coefficient with respect to a solid state of the semiconductor film.

8. (Original) A laser irradiation method according to claim 7, wherein the first pulse laser beam is one selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO₂ laser, a YAG laser, a Y₂O₃ laser, a YVO₄ laser, a GdVO₄ laser, a YLF laser, a YAlO₃ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

9. (Original) A laser irradiation method according to claim 7, wherein the second pulse laser beam is one selected from the group consisting of a CO₂ laser, a YAG laser, a Y₂O₃ laser, a YVO₄ laser, a GdVO₄ laser, a YLF laser, a YAlO₃ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

10. (Previously Presented) A laser irradiation method according to claim 7, wherein each of the first pulse laser beam and the second pulse laser beam is shaped into a linear beam.

11. (Original) A laser irradiation method according to claim 7, wherein the first pulse laser beam satisfies an inequality of $\phi_1 \geq \arctan (W_1/2d)$, where ϕ_1 is an incident angle of the first pulse laser beam, W_1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

12. (Original) A laser irradiation method according to claim 7, wherein the second pulse laser beam satisfies an inequality of $\phi_2 \geq \arctan (W_2/2d)$, where ϕ_2 is an incident angle of the second pulse laser beam, W_2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

13. (Original) A laser irradiation method comprising:

irradiating a semiconductor film formed over a substrate with a first pulse laser beam and a second pulse laser beam while relatively moving the semiconductor film so that areas which are irradiated with the first pulse laser beam and with the second pulse laser beam are overlapped with each other,

wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized, and

wherein the first pulse laser beam has a wavelength range of which an absorption coefficient with respect to a solid state of the semiconductor film is 5×10^3 /cm or more, and the second pulse laser beam has a wavelength of which an absorption coefficient with respect to a solid state of the semiconductor film is 5×10^2 /cm or less and an absorption coefficient with respect to a molten state of the semiconductor film is 5×10^3 /cm or more.

14. (Original) A laser irradiation method according to claim 13, wherein the first pulse laser beam is one selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO₂ laser, a YAG laser, a Y₂O₃ laser, a YVO₄ laser, a GdVO₄ laser, a YLF laser, a YAlO₃ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

15. (Original) A laser irradiation method according to claim 13, wherein the second pulse laser beam is one selected from the group consisting of a CO₂ laser, a YAG laser, a Y₂O₃ laser, a YVO₄ laser, a GdVO₄ laser, a YLF laser, a YAlO₃ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

16. (Previously Presented) A laser irradiation method according to claim 13, wherein each of the first pulse laser beam and the second pulse laser beam is shaped into a linear beam.

17. (Original) A laser irradiation method according to claim 13, wherein the first pulse laser beam satisfies an inequality of $\phi_1 \geq \arctan (W_1/2d)$, where ϕ_1 is an incident angle of the first pulse laser beam, W_1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

18. (Original) A laser irradiation method according to claim 13, wherein the second pulse laser beam satisfies an inequality of $\phi_2 \geq \arctan (W_2/2d)$, where ϕ_2 is an incident angle of the second pulse laser beam, W_2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

19.-28. (Canceled)

29. (Currently Amended) A method for manufacturing a semiconductor device comprising:

forming an amorphous semiconductor film over a substrate;

crystallizing the amorphous semiconductor by irradiating the amorphous semiconductor film with a laser beam;

patterning the crystalline semiconductor film into a semiconductor layer; and

forming a channel formation region including at least a part of the semiconductor layer,

wherein areas which are irradiated with ~~[[the]]~~ a first pulse laser beam and with the a second pulse laser beam are overlapped with each other,

wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized; ~~[[and]]~~

wherein a wavelength of the first pulse laser beam is equal to or shorter than that of visible light, and a wavelength of the second pulse laser beam is longer than that of the first pulse laser beam.

wherein a pulse width of the first pulse laser beam and a pulse width of the second pulse laser beam are different from each other, and
wherein the second pulse laser beam is a fundamental wave.

30. (Original) A method for manufacturing a semiconductor device according to claim 29, wherein the first pulse laser beam is emitted from a laser selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO₂ laser, a YAG laser, a Y₂O₃ laser, a YVO₄ laser, a GdVO₄ laser, a YLF laser, a YAlO₃ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

31. (Original) A method for manufacturing a semiconductor device according to claim 29, wherein the second pulse laser beam is emitted from a laser selected from the group consisting of a CO₂ laser, a YAG laser, a Y₂O₃ laser, a YVO₄ laser, a GdVO₄ laser, a YLF laser, a YAlO₃ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

32. (Original) A method for manufacturing a semiconductor device according to claim 29, wherein the first pulse laser beam and the second pulse laser beam are respectively shaped into linear beams.

33. (Original) A method for manufacturing a semiconductor device according to claim 29, wherein the first pulse laser beam satisfies an inequality of $\phi_1 \geq \arctan(W_1/2d)$, where ϕ_1 is an incident angle of the first pulse laser beam, W_1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

34. (Original) A method for manufacturing a semiconductor device according to claim 29, wherein the second pulse laser beam satisfies an inequality of $\phi_2 \geq \arctan$

($W2/2d$), where $\phi2$ is an incident angle of the second pulse laser beam, $W2$ is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

35. (Original) A method for manufacturing a semiconductor device comprising:
forming an amorphous semiconductor film over a substrate;
crystallizing the amorphous semiconductor film by irradiating the amorphous semiconductor film with a laser beam;
patterning the crystalline semiconductor film into a semiconductor layer; and
forming a channel formation region including at least part of the semiconductor layer,
wherein areas which are irradiated with the first pulse laser beam and with the second pulse laser beam are overlapped with each other,
wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized, and
wherein the first pulse laser beam melts the semiconductor film, and the second pulse laser beam satisfies $\alpha \geq 10\beta$, where α denotes an absorption coefficient with respect to a molten state of the semiconductor film, β denotes an absorption coefficient with respect to a solid state of the semiconductor film.

36. (Original) A method for manufacturing a semiconductor device according to claim 35, wherein the first pulse laser beam is emitted from a laser selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

37. (Original) A method for manufacturing a semiconductor device according to claim 35, wherein the second pulse laser beam is emitted from a laser selected from the group consisting of a CO₂ laser, a YAG laser, a Y₂O₃ laser, a YVO₄ laser, a GdVO₄ laser, a YLF laser, a YAlO₃ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

38. (Original) A method for manufacturing a semiconductor device according to claim 35, wherein the first pulse laser beam and the second pulse laser beam are respectively shaped into linear beams.

39. (Original) A method for manufacturing a semiconductor device according to claim 35, wherein the first pulse laser beam satisfies an inequality of $\phi_1 \geq \arctan(W_1/2d)$, where ϕ_1 is an incident angle of the first pulse laser beam, W₁ is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

40. (Original) A method for manufacturing a semiconductor device according to claim 35, wherein the second pulse laser beam satisfies an inequality of $\phi_2 \geq \arctan(W_2/2d)$, where ϕ_2 is an incident angle of the second pulse laser beam, W₂ is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

41. (Original) A method for manufacturing a semiconductor device comprising:
forming an amorphous semiconductor film over a substrate;
crystallizing the amorphous semiconductor film by irradiating the amorphous semiconductor film with a laser beam;
patterning the crystalline semiconductor film into a semiconductor layer; and
forming a channel formation region including at least a part of the semiconductor layer,

wherein areas which are irradiated with the first pulse laser beam and with the second pulse laser beam are overlapped with each other,

wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized, and

wherein the first pulse laser beam has a wavelength range of which an absorption coefficient with respect to a solid state of the semiconductor film is 5×10^3 /cm or more, and the second pulse laser beam has a wavelength of which an absorption coefficient with respect to a solid state of the semiconductor film is 5×10^2 /cm or less and an absorption coefficient with respect to a molten state of the semiconductor film is 5×10^3 /cm or more.

42. (Original) A method for manufacturing a semiconductor device according to claim 41, wherein the first pulse laser beam is emitted from a laser selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO₂ laser, a YAG laser, a Y₂O₃ laser, a YVO₄ laser, a GdVO₄ laser, a YLF laser, a YAlO₃ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

43. (Original) A method for manufacturing a semiconductor device according to claim 41, wherein the second pulse laser beam is emitted from a laser selected from the group consisting of a CO₂ laser, a YAG laser, a Y₂O₃ laser, a YVO₄ laser, a GdVO₄ laser, a YLF laser, a YAlO₃ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

44. (Original) A method for manufacturing a semiconductor device according to claim 41, wherein the first pulse laser beam and the second pulse laser beam are respectively shaped into linear beams.

45. (Original) A method for manufacturing a semiconductor device according to claim 41, wherein the first pulse laser beam satisfies an inequality of $\phi_1 \geq \arctan(W_1/2d)$, where ϕ_1 is an incident angle of the first pulse laser beam, W_1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

46. (Original) A method for manufacturing a semiconductor device according to claim 41, wherein the second pulse laser beam satisfies an inequality of $\phi_2 \geq \arctan(W_2/2d)$, where ϕ_2 is an incident angle of the second pulse laser beam, W_2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.